

NEWS LETTER FILE COPY

Society of American Bacteriologists

OFFICE OF THE
SECRETARY-TREASURER

STERLING WINTHROP RESEARCH INSTITUTE
RENSSELAER, N. Y.

VOLUME 20

November 1954

NUMBER 4

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NOTICE

Members are requested to address all correspondence concerning applications for membership, payment of dues, changes of address, lost copies of the *Journals*, resignations and the like directly to:

Society of American Bacteriologists
Mr. Francis C. Harwood,
Business Manager

Mt. Royal and Guilford Avenues
Baltimore 2, Maryland

Remittances should be made payable to:
Society of American Bacteriologists.

AMENDMENT OF THE CONSTITUTION

The mail balloting on amending section 3 of Article VIII of the constitution of the S.A.B. resulted in 2350 votes to amend, 564 against. This is almost 4:1 in favor of the amendment and well in excess of the majority acquired by the constitution. Therefore, Article VIII section 3 of the constitution now reads: "The time and place of each annual meeting shall be fixed by the Council and notice of the same shall be sent to each member of the Society at least three weeks previous to the date of said meeting".

The revision was necessary for the proper functioning of the Society in holding annual meetings. Hotels, particularly those of sufficient size to accommodate the S.A.B. annual meeting, have been, and still are, booked for conventions more than two years in advance. To be assured of space and room reservations it was necessary for the local committees conducting the annual meetings to make commitments in advance of the period allowed under the old provisions of the constitution.

Not a few of the members voting against the amendment commented on their negative vote. Oddly enough nearly all those who wrote comments on the ballot objected to the last clause of the proposed amendment: "... and notice of the same shall be sent to each member of the Society at least three weeks previous to the date of said meeting" by such remarks as "how do you expect me to make plans, get reservations and obtain funds on 3 weeks notice?" or "... three weeks notice is not sufficient time to prepare for attendance to any meeting...". This criticism might be valid were it not for the fact that no alteration in the last clause was made in the amendment voted upon. Indeed, about the only debate on the question of this revision of the constitution at the Business Meeting was to *insist* that the clause in question be retained.

It is more than a little different to understand how a member of the SAB could believe that it would be possible to hold an annual meeting on three weeks notice to the members. The time required to distribute to members the abstract blanks for papers to be presented at the meeting, have these returned to the Program Committee, have this committee distribute the abstracts into the various divisions, prepare the program, have it and the abstracts of the papers set in type, proof read, corrected, printed, bound, prepared for mailing is about three months.

It may well be that the last clause of section 3, Article VIII should be deleted. The wording of this clause is a hold over from the time when the Society was small in numbers, the meeting was not as long and abstracts of papers to be presented were not published prior to the meeting.

ABSTRACTS OF PAPERS FOR THE 1955 MEETING

Blanks for submitting abstracts of papers for presentation at the New York Meeting May 8-13, 1955 have been mailed with this issue of the News Letter. Abstracts must be in the hands of the Program Committee not later than February 7, 1955 to be considered, and should be sent to Dr. Orville Wyss, Department of Bacteriology, University of Texas, Austin, Texas.

Abstracts must be informative and deal with microbiology; those that do not meet these requirements will not be considered for acceptance by the Program Committee. Furthermore, members are reminded that the Bylaws of the Society provide that the number of titles which a member, alone or as joint author, may submit is limited to one. The Program Committee will adhere strictly to this Bylaw (5.g).

ROUND TABLE DISCUSSIONS 1955 MEETING

The experiment in informal round table discussions as conducted at the Pittsburgh meeting appears to have been so successful that the same general procedure will be used at the New York meeting next May 8-13. Dr. Gladys L. Hobby has been appointed Chairman, Round Table Sessions Rooms.

In order that members not acquainted with the idea of the informal round table may understand the procedure, the following is reprinted from the January 1954 News Letter:

"During the past years there has been some nostalgic reference to the days before the symposia lost their round table character. As an experiment the program committee will provide at the Pittsburgh meeting two small rooms holding about 25 chairs which will be available throughout the meeting on the first come first served basis for anyone who wishes to organize a round table dis-

cussion. Here is an example showing how it is expected to operate. Dr. O. B. Williams of the University of Texas will write to 4 or 5 people who are working on problems similar to one of his current interests and ask them if they would meet with him for an informal discussion of the problem and to invite one or two others that they know to be actively interested. When the Programs are distributed Dr. Williams will select a morning, afternoon or evening, when the scientific sessions appear thin fare for his interest group and write to the program chairman reserving a room, giving a first and second choice of time. The time and room assigned will be posted at the reservation desk under the name O. B. Williams, and the participants may fill out their group to the capacity of the room by word of mouth invitations. Dr. Erwin Neter and Dr. R. V. Hussong have both promised to consider organizing similar experimental round tables. The two rooms available for morning, afternoon and evenings for four days could accomodate 24 such meetings so here is your chance to tailor the meeting to fit your interests by organizing a round table discussion group."

Obviously, the references to specific persons acting as organizers of the round tables do not hold for the New York Meeting and are used as illustration only. Requests for rooms for Round Table discussions should be sent to Dr. Gladys L. Hobby, Chas. Pfizer and Company, 11 Bartlett Street, Brooklyn 6, N. Y.

DIVISION OF AGRICULTURAL AND INDUSTRIAL BACTERIOLOGY

Through an error, the origin and nature of which it is not necessary to discuss, the officers of the Division of Agricultural and Industrial Bacteriology were incorrectly stated on page 4 of the August News Letter. The officers of this section for 1954-55 are as follows:

Chairman—John C. Ayres
Vice-Chairman—J. L. Roberts
Secretary—John H. Silliker

CHANGES OF ADDRESS

This is a reminder to members who change their address. To make sure of receiving every issue of their subscription to the publications of the Society (including Applied Microbiology), members who change their address should do two things: first, notify the *publisher*, Williams and Wilkins Co., Baltimore 2, Maryland, not less than 60 days before they move, of their new address (giving the old as well) and, second, fill out Form 22 at the Post Office of the old address. Form 22 constitutes a guarantee of payment of forwarding charges from the old to the new address.

Changes in the Postal Laws and Regulations have combined with increases in postal rates to

make prohibitive the expense of redeeming from the post office copies of the Society's publications that could not be delivered because of change of address. These copies will be destroyed by the post office. Where a member has failed to notify the *publisher* at least 60 days in advance of a change of address and has not filed Form 22 with the post office of the old address, the missed issues may be purchased at the regular single copy rate, if available.

Remember, notify the *publisher* at least 60 days in advance of any change in address.

POST-DOCTORAL FELLOWSHIPS

Three \$4,000 post-doctoral fellowships in Statistics are offered for 1955-56 by the University of Chicago. The purpose of these fellowships, which are open to holders of the doctor's degree or its equivalent in research accomplishment, is to acquaint established research workers in the biological, physical, and social sciences with the role of modern statistical analysis in the planning of experiments and other investigative programs, and in the analysis of empirical data. The development of the field of Statistics has been so rapid that most current research falls far short of attainable standards, and these fellowships (which represent the fifth year of a five-year program supported by The Rockefeller Foundation) are intended to help reduce this lag by giving statistical training to scientists whose primary interests are in substantive fields rather than in Statistics itself. The closing date for applications is February 15, 1955; instructions for applying may be obtained from the Committee on Statistics, University of Chicago, Chicago 37.

SUMMER RESEARCH AWARDS FOR COLLEGE FACULTY MEMBERS

The Lalor Foundation announces a new program for 1955 to include 20 summer or interim awards to college and university faculty members for study and research in which chemistry or physics is used to attack problems in any of the biological sciences. Each award will normally not exceed \$900 to single men and women and \$1,100 to married persons, but is subject to circumstances. The place of work may be at the faculty member's own institution or elsewhere, as may fit the best interests of the program.

It is the hope of the Foundation that not only significant research, but also more dynamic teaching of science may result from this new program and that younger faculty members may find opportunity by this means to advance in their profession.

Also, the Foundation continues with its eighth year of underwriting of awards of postdoctoral summer fellowships administered by the Marine

Biological Laboratory at Woods Hole, Massachusetts.

The Foundation is discontinuing its previous program of full-year predoctoral and postdoctoral fellowship awards.

Inquiries respecting the new faculty summer awards should be directed to C. L. Burdick, Director of the Lalor Foundation, 4400 Lancaster Pike, Wilmington 5, Delaware. Applications for these awards must be filed before January 15, 1955.

Inquiries regarding Marine Biological Laboratory postdoctoral summer awards should be directed to the Marine Biological Laboratory, Woods Hole, Massachusetts. The final filing date for these applications is February 1, 1955.

LEDERLE MEDICAL FACULTY AWARDS

The Lederle Laboratories Division of American Cyanamide Company announces the second year of their *Medical Faculty Awards* for the academic year 1954-55.

The purpose of the program of these Awards is to encourage men and women who have progressed beyond the stage of development which is now encompassed by the post-doctorate fellowships or the so-called senior fellowships in pre-clinical sciences. The program will aid in the support of promising teachers and investigators, particularly in the fields of anatomy, biochemistry, microbiology, pathology, pharmacology and physiology, for a limited period, in the hope and expectation that the medical schools which have appointed them, or some other schools, will thereafter be ready and willing to provide for their future support. The plan is also intended to assist departments which could benefit by expansion and which could offer opportunities for development of promising individuals.

The Awards will be administered by an independent committee, composed of professors representing most of the pre-clinical sciences and drawn from medical schools throughout the United States. The committee for 1954-55 consists of:

Dr. Windsor C. Cutting
San Francisco
Dr. Robert F. Pitts
New York City
Dr. Morris F. Shaffer
New Orleans
Dr. Maxwell Finland
Boston
Dr. George Sayers
Cleveland
Dr. Douglas H. Sprunt
Memphis

The Committee will have full and independent authority in the selection of the schools through

which Awards are to be made and of recipients of the Awards.

All Awards will be made directly to a designated medical school in the United States or Canada and will be specified for the use of the department for the support of the stated grantee and his total academic activities.

Candidates for, and recipients of, Lederle Medical Faculty Awards must hold "faculty rank", such as Assistant Professor or Associate Professor (or their equivalent, as determined by the Committee) in their medical schools, and should be individuals who give promise of staying on to continue teaching and research within the disciplines indicated above. Individuals chosen for the Awards are to have full privileges and responsibilities as regular faculty members for teaching and research.

Awards will be made for a term not exceeding three years, provided that the conditions of the award are fulfilled. The only restriction in the case of each recipient is that the total amount, which will be awarded at a rate to be determined by the Committee, shall not exceed \$10,000 in any one year to any one grantee.

The funds should be used primarily to increase or to create salaries for the designated individuals but they may be used, in part, to support the departmental activities of the individual within the total amount granted. The funds are meant to augment, but not replace, funds already available for the department in question; they are not intended as, and will not be used for "recapture" funds.

There are no formal application blanks. Nominations for Lederle Medical Faculty Awards should be submitted to the Committee through the Office of the Dean of the medical school and should be endorsed by him. Only one candidate from each school will be considered in any given year. It is suggested that the most suitable candidate be selected by a committee of the faculty on the basis of personal qualifications and departmental needs.

The following information should be prepared by the head of the department and transmitted with the nomination:

- (1) a curriculum vitae of the candidate;
- (2) a list of the candidate's publications, with complete citations and the names of co-authors, if any;
- (3) information supporting the candidate's eligibility;
- (4) a general outline of the total program of departmental activities proposed for the candidate;
- (5) reasons for requesting the support and a statement as to the ways in which the department will be benefitted by an award;
- (6) a budget, outlining the projected manner in

which the funds requested will be expended and giving the current and projected salary of the candidate and its sources.

A candidate will receive consideration only if it is clearly evident that the departmental funds will be augmented by the full amount of the award and that the increase will be used principally for salaries.

An independent statement from the individual who is recommended should be sent directly to the Committee.

THE INCOMPLEAT BACTERIAL PHYSIOLOGIST

Background

In 1952 the American Physiological Society undertook a survey to secure possible answers to such questions as:

What is physiological science?

How much of all science is physiological?

Are physiologists receiving proper training and support for their careers?

A discussion of this and many other goals of the Survey has been summarized in a pamphlet issued in April, 1953.* Although originally the Survey was intended only for animal physiologists, on completion of a pilot stage it was decided to extend certain portions of it to plant and bacterial physiologists. These included a major aspect of the Survey: a study of the characteristics of the population of physiologists as revealed by the questionnaire technique, a project designed and administered by the Survey Research Center of the Institute of Social Research, University of Michigan. Although the most interesting and valuable judgments based on this study must await publication of the final report, the author, who represents bacterial physiology on the Central Committee of the Survey, has been encouraged to summarize some of the findings that are of particular interest to microbiologists as such. For the most part these will deal with the human interest aspect of the survey together with information of concern to our *Society*. The more profound and valuable findings dealing with the physiologist's activities in research and teaching are probably best treated as a part of the larger group as then revealing comparisons are possible.

The 4571 physiologists who answered the questionnaires represented a return of more than 75%; they were divided as follows: animal, 64%; plant, 21; bacterial, 12; and the remainder, "fringe". As with the other groups, the bacterial physiologists are further subdivided into: those that claim physiology as their first competency, the *Central* group numbering 171; and those who claim

Nominations for Awards to be activated during the academic year 1955-1956 should be submitted by February 1, 1955. Announcements of the Awards will be made by May 1, 1955.

While the Lederle Medical Faculty Awards Committee will be interested in the progress of each grantee, no formal reports will be required.

Address all communications to:

LEDERLE MEDICAL FACULTY AWARDS
Office of the Secretary
Pearl River, New York

physiology not as a first but as an additional competency, the *Peripheral* group numbering 385. Since 292 of this *Peripheral* group name as their first competency merely the more inclusive term, *Microbiology*, and since 83% of the *Central* group describe themselves also as microbiologists, it is suggested that together the two categories represent a fairly good cross section of the *Society*, particularly of the nonmedical Division, and not merely the Division of Physiology. This point of view is adopted in the following analysis in which the results from the two categories have been combined; such a procedure appears the more legitimate since rarely did the responses from the two groups differ significantly. When this is done, we have a sample representing about 15% of the *Society's* membership at the time the survey was begun (and, of course, a considerably higher percentage of the nonmedical members). This sample might appear limited, but the officers of the *Society* often have to make decisions on important matters from polls in which the return of ballots is even less. Although in the following discussion, we shall use the term *bacterial physiologist*, we believe that many of the conclusions may be extended to the membership of the *Society* as a whole.

Part I. Profile of a Bacterial Physiologist

Personal. Like his field the bacterial physiologist is young, 72% of the group being less than 40 years of age. Some 90% are males and 85% are married; the average (median) family is small, 3. To a considerable extent (42%) he grew up in a city (population more than 100,000); only 13% were raised on a farm. About one-half came from families in which, to use L. M. N. Bach's* graphic description, "the fathers were in occupations demanding some degree or form of aggressive social action (salesmen, managers, proprietors, officials, teachers) rather than what might be called 'the lonely and quiet competencies' such as farmers or craftsmen." The geographical distribution of bacterial physiologists is summarized in table 1, and their economic status in table 2. Anticipating the final

* On request can be obtained from the author of this contribution.

* Director of the Survey.

TABLE 1
Geographical Distribution of Bacterial Physiologists

Region ¹	Birthplace	Education		Job
		BS ²	PhD	
New England	8%	9%	8%	5%
Middle Atlantic	28	25	21	20
E. No. Central	19	22	33	26
W. No. Central	12	12	14	7
E. So. Central	2	2	— ³	3
W. So. Central	3	6	3	6
S. Atlantic	3	5	6	15
Mountain	4	4	1	2
Pacific	5	10	10	12
Canada	4	4	1	2
Other Countries	8	2	1	—

¹ Based on standard Census Bureau classification.

² Or BA.

³ Less than 0.5%.

Note that on this and other tables the total may not add to 100% as not all respondents answered all questions.

TABLE 2
Financial Rewards of Practicing Bacterial Physiology

Age	Number	Median Income
<30	16	\$4,000
30-39	275	6,100
40-49	109	7,600
50-59	30	8,000
60-69	11	9,300
<i>Kind of Institution</i>		
Academic	299	5,600
Industrial	104	6,800
Governmental	89	6,500

report and to satisfy the curious, it can be said that at all ages his median salary is slightly more than that of his opposite number among the plant physiologists but definitely less than that of animal physiologist—except when he passes 60 years. Even this apparent reward in "old age" might be a mirage because of the small number in the sample.

Education. The bacterial physiologist is well educated if degrees are a reliable index since 80% have the PhD or equivalent; merely 5% have only one degree. His youth is emphasized by the fact that 40% have taken the PhD since 1950. Only $\frac{1}{2}$ received it within 4 years after the BS (BA)—usually considered to be the normal period of additional study—and 14% report a lag of 10 years or more. Surely this delay reflects a dislocation in normal pursuits occasioned by World War II. Generally, he received his undergraduate training at a small school if by "small" we understand one less than 12,000 students. The 25 "large" schools listed in the Education Directory of the U. S. Department of Health, Education and Welfare, however, trained 54% of the PhDs. As an under-

graduate about $\frac{1}{4}$ majored in bacteriology, another $\frac{1}{4}$ in chemistry, $\frac{1}{6}$ in biology with the remainder scattering. About $\frac{3}{5}$ had an undergraduate academic average of B plus or better, but 17% confess to one of B minus—or worse.

The PhD major for 73% of those polled was simply bacteriology; only 9% list the more specialized field of bacterial physiology, the same percentage as for biochemistry. About nine-tenths of bacterial physiologists state that the most influential factor causing them to enter the field was *content*; a college lecturer influenced 39% and a graduate professor, 27%. More crass factors operating were availability of positions, 11% and monetary rewards, only 3% (see table 2 for far-sightedness of this view). Two-thirds of bacterial physiologists considered entering another field, usually medicine (24%); chemistry lost 13% (but biochemistry only 2%) while 10% had even considered nonscientific fields.

As a reflection of his training and probably of his selection of a specialty, the bacterial physiologist believes a course in *general physiology* should be taught as a prerequisite for all graduate students in a physiological science, but he is not sure if this should be at the undergraduate or graduate level. More certainty is expressed as to what he would choose if he could take his training over—and this time had the choice. Over 50% regret that while in college they did not take more chemistry, biochemistry and mathematics; 33% would include physics, but few wanted additional training in botany or zoology. Training in special techniques, that bone of contention between those responsible for and those that criticize the adequacy of college curricula, was desired by only 17%.

Part II. The Professional Bacterial Physiologist

His job. The bacterial physiologist is busy, over 90% reporting full time employment with only 4% out of work or retired. Two-thirds have held their present jobs for 5 years or less and 15% for less than one year. In spite of what might be criticized as limited experience he knows *where* he wishes to work and *why*, as revealed in table 3. Most apparently have found a job to their taste, however, as only 7% voiced dissatisfaction with their present one with 9% additional sitting on the fence. If he is employed in an academic institution, he is likely to be at the associate professor level. There, he would like to spend some more time on research (but 40% were satisfied), about the same amount of time on teaching (but 28% were willing to put in a little more time) and certainly no more time on administration (except for a minority of 7%).

Whether he works for an academic, industrial or governmental institution, he believes that promotions are based on several factors and the world as it is is not the world as he would like it. His forth-

TABLE 3

The Pattern of Employment of Bacterial Physiologists

	Academic		Industry		Government	
	C	P	C	P	C	P
Present job	63	54	12	24	19	16
Previous job	68	78	33	28	28	26
Preference	80	70	8	19	7	7
	(398)		(85)		(25)	
<i>Reasons for choice</i>						
Freedom	82		17		40	
Nature of work	41		42		50	
Material rewards	4		76		72	
Funds available	3		21		35	
Atmosphere and associates	14		4		0	
Nonpreference	2	6	44	40	44	43
	(26)		(224)		(231)	
<i>Reasons for choice</i>						
Freedom	4		77		62	
Nature of work	37		31		18	
Material rewards	65		5		23	
Funds available	17		4		3	
Atmosphere, goals and associates	4		26		20	

Figures in parentheses are actual numbers in each group; all other figures are percentages. Because of some interesting differences between the two groups of responses *Central* (C) and *Peripheral* (P), a breakdown is supplied in some categories. Note that in the nonpreference reasons for choice it is the lack of or dislike of the named factors that is responsible for the desire *not* to be employed by such an institution.

right and probably realistic if somewhat cynical beliefs on this matter are contained in table 4.

His society. With reference to professional organizations the word for the bacterial physiologist is gregarious, 90% of them belonging to at least one scientific society and one-half to three or more. His allegiance is unmistakable, 86% of the *Central* group naming the Society of American Bacteriologists (SAB) as their primary professional society. The *Peripheral* group is more divided: 54% consider the SAB as their primary society, followed by the American Chemical society (ACS), 17%; and the American Society of Biological Chemists (ASBC), 7%. Sixty per cent of both groups have been members for 5 years or more; 22% report service to the SAB as office holders or members of committees—i.e., somewhat more active than their relative number (18%) in the Society would predict. Three-fourths believe that the present bases of membership are satisfactory, while $\frac{1}{4}$ would make them more stringent. One per cent voted for less stringent requirements—just what these had in mind is not clear.

In spite of the fact that bacterial physiologists

TABLE 4

Beliefs Regarding Factors That Influence the Promotion of Bacterial Physiologists

Factor	Influence					
	Considerable		Some		Little	
	I	II	I	II	I	II
Length of service	25	10	48	68	18	15
Quality of research	45	86	35	9	13	1
Number of papers	29	10	38	54	23	28
Teaching	10	40	27	25	48	24
Administrative ability	24	26	33	47	30	20
Ability to get funds	8	2	23	25	54	61
Other job offer	18	2	33	20	35	67
"Who you know"	16	1	32	5	42	83

In this table figures under I represent the percentage of respondents who believed that the factor *does* have the indicated influence (considerable, some or little); those under II the percentage that believed it *should* have the indicated influence.

are well represented on the rolls of societies, nearly one-half would like to belong to at least one more, the most frequently desired memberships being:

	C	P
ASBC.....	35	28
ACS.....	22	16
AAAS.....	8	8
SAB.....	6	6

At first glance the desire for membership in the chemical societies may appear to be the reverse of what would be expected, but this may only indicate that already many of the *Peripheral* group belong to these two societies. Unless it be financial, it is difficult to understand why any bacterial physiologist should be frustrated at not being enrolled in either the AAAS or the SAB—certainly he would be eligible.

The officers of the SAB (or any other society) undoubtedly often feel unappreciated for their apparently unnoticed service to the group. The vote of confidence they received in answer to the question: "All in all, how do you feel about the way this society is run?" should be rewarding and encouraging. Over 90% of both the *Central* and the *Peripheral* groups were satisfied; only 4% dissatisfied.

The annual meeting. A constant concern of the Program Committee of the Society is what do the members wish at the annual meeting. Reassuring was the vote, then, that 42% considered the annual meeting to be satisfactory as it is now held, and only 4% recorded acute dissatisfaction. The latter together with the 52% who thought some improvement could be achieved listed a number of suggestions that certainly should be carefully studied by

TABLE 5
*Role of Various Media of Communication in Keeping
the Bacterial Physiologist Informed*

	Extent of Use			Adequacy		
	Consid- erable	Some	Little	Satisfied	Need some improve- ment	Need much improve- ment
Journals	86	13	1	61	33	3
Abstracts	44	40	13	53	35	11
Annual Revs.	37	46	14	55	35	8
Monographs	18	45	30	45	31	10
Society meet- ings	19	48	28	28	54	13
Conferences, seminars	22	44	28	30	40	22

the Program Committee. Space will permit only the listing of some of the more popular ones:

Criticism of organization; conflicts in program.....	7%
Desire for fewer (but not longer) papers.	8
Selection of papers to improve quality.	15
More roundtables and symposia.....	7

Equally significant, perhaps, is the low vote registered against several often criticized aspects of a meeting. Improvement in presentation of papers was voiced by only 3%; not sticking to schedule only 1% (chairman of section meetings, take a bow); location of meeting, 2%. Somewhat more criticized were inadequate facilities including poor ventilation by 4% and lack of discussion, also 4%. Perhaps the most surprising result and one that will be appreciated by the unnamed scores that yearly have worked on the annual meeting is that, unsolicited, 7% thought the sessions are good and have improved.

To conclude this account on a more mundane note, nearly $\frac{1}{2}$ report they must present a paper at the meeting to have their expenses paid. It is not clear, however, if this is only necessary or is both necessary and sufficient.

Communication. Table 5 summarizes the significant reactions to inquiries designed to learn how the bacterial physiologist keeps abreast of advances in his field. Three-fourths reported that through use of these media they believe their efforts are reasonably successful. Failure, if it exists, was usually ascribed to lack of time (47%) or too many publications, too widely scattered and too much content in the field (40%). Surprisingly, only about 10% felt that time lag in publication or limited access to published material were important handicaps. Five per cent frankly stated that the fault was personal—either not sufficiently motivated or trained. On a point of personal privilege, the author notes with satisfaction that a mere 6% thought that inadequate reviews was a bar to their efforts to keep posted.

Remarks

It is perhaps unnecessary to remind the reader that the single person not found in a population is the "average"; hence the resemblance of the bacterial physiologist I have described to either my colleagues or myself is not only coincidental but also highly improbable. But, as a population we have the characteristics enumerated in this report. Other interesting and even entertaining properties of this population will be evident in the final report of this Survey.* For example, the median research budget appears to be about \$10,000 annually and 80% regarded this as adequate. One-third of those polled have the responsibility of obtaining this budget and about two-thirds of these believe this was not too difficult; this latter belief certainly would have been quite different in the middle thirties. As a result of the expenditure of these funds (45% of which came from the employing institute and most of the remainder from non military governmental contracts) a median yield of 3 to 4 papers was obtained—about \$3,000 per paper. Discouragingly, some 15% reported publishing more than 10 papers a year.

It is appropriate to close on the expressed belief that the future appears to be in good hands. Over one-half of the respondents were supervising students working for the PhD degree, and about four-fifths of these thought such "apprentices" would make "good" to "very good" physiological scientists. The main difficulties that might bar any one of them from reaching that state were believed to be lack of adequate training in the physical sciences (by 27%) or in mathematics (16%). Personal handicaps were also mentioned as: not sufficient intelligence (12%), inappropriate attitudes (11%), insufficient motivation (10%), and that ubiquitous fault, the desire for money (5%). Against one belief I shall, in closing, enter a caveat. I submit it to be unwarranted optimism when only 4% think that inadequate training in writing and other forms of communication will be an important handicap.

PERRY W. WILSON
Department of Bacteriology
University of Wisconsin

CULTURES WANTED

Dr. James A. Harrison, Temple University, Philadelphia 22, Pa., would appreciate receiving any known or suspected cultures of *Alcaligenes* with brief histories of the cultures, if available.

APPLIED MICROBIOLOGY

The library of the Western Branch of the National Canners Association is trying to complete

* Not to overlook our own poll that revealed that 76% of the bacterial physiologists did not feel certification was necessary.

their set of Applied Microbiology by acquiring numbers 1 and 2 of Volume 1. Anyone willing to dispose of these issues should notify Mrs. G. E. Mastoris, Librarian, Research Laboratories, Western Branch, National Canners Association, 1950 Sixth Street, Berkeley 2, California.

A BACTERIOLOGICAL ANNIVERSARY

The things with which we are constantly in contact are, naturally enough, generally accepted without thinking of either their origin or antiquity. 1954 is the 100th anniversary of the cotton plug as used in bacteriology. This device for admitting air but excluding air-borne contaminants was used by Schröder and Von Dusch. ("Über Filtration der Luft in Beziehung auf Fäulniss und Gährung". *Annalen der Chemie und Pharmacie* 1854, LXXXIX p 234) in their experiments on biogenesis two years before Pasteur's "Memoire sur la fermentation appelee lactique" was published and a year before the Bunsen burner was developed.

When was the rolled plug first used and by whom?

NEWS OF OUR MEMBERS

Dr. J. R. Porter spoke on the history and present status of the Journal of Bacteriology to members of the Society of American Bacteriologists at Camp Detrick on August 3rd. Dr. H. O. Halverson, Vice President of the Society, Dr. W. J. Nungester, past President of the Society and Dr. Porter reviewed various phases of the basic research program during their visit.

Dr. Margaret Pittman, National Institutes of Health, Bethesda, Md., was awarded the honorary degree of LL.D. at the May 30th commencement of her undergraduate alma mater, Hendrix College, Conway, Ark. Dr. Pittman is president-elect of the Washington Academy of Sciences and will take office January 1955.

Sigma Alpha Omicron, the bacteriological honorary society at the University of Maryland has designated David A. Power as the recipient of its annual award. The award consists of a membership in the S.A.B. and the engraving of the recipients name on a plaque which hangs in the Department of Bacteriology quarters at the University of Maryland.

NEW BOOKS

An Introduction to Bacterial Physiology. E. L. Oginsky and W. W. Umbreit. San Francisco, W. H. Freeman and Company. 1954. XI + 404 pp. \$7.50; text edition, \$6.00.

For many years there has been an acute need for a textbook introducing the principles of bacterial physiology to undergraduate students. In the past,

brief monographs have been written which are wholly inadequate for undergraduate teaching and the larger volumes have been mostly concerned with more advanced and specialized aspects of physiology. Oginsky and Umbreit have done exceedingly well in an attempt to integrate the complexities of this subject on a comparatively elementary level. One of the problems confronted by all teachers of bacterial physiology, both on the elementary and advanced level, is the necessity of teaching general principles of physical chemistry and biochemistry for a complete understanding of physiology. Until recently the inclusion of these subjects in bacterial physiology was necessitated by the unavailability of adequate text books in these disciplines and in the case of biochemistry many colleges had not sufficiently oriented this subject in the direction of metabolic activities of cells. At the present time excellent text books and courses of instruction in these fields are available which serve very adequately as a prerequisite to bacterial physiology, thereby alleviating the responsibility of coverage of the principles of these disciplines. The authors of this text book have included many of these principles, and have not adequately discussed them in relation to the problems unique to physiology of bacteria. For example Section 4 which deals with Metabolism, comprises approximately 37% of the book and most of the material covered deals with pure biochemistry. Students who elect or are required to take bacterial physiology, it would seem, must have as a prerequisite a good course in biochemistry. An urgent need is a textbook which discusses these principles in connection with the highly interesting and sometimes unique physiological processes of bacteria.

Sections I, II, III which deal with the Nature of Bacterial Physiology, Bacterial Anatomy and Populations, respectively, are written lucidly and in a stimulating form. The highly controversial subject of cytology has been presented well for undergraduate students. Bacterial growth is discussed very clearly and students should not experience any difficulty understanding the explanation of the growth cycle.

Considering the fact that one of the authors has done a great deal in the field of physiology of autotrophs it is unfortunate that chapter 15 which covers this topic is only eight pages in length, hardly an adequate coverage for the numerous interesting physiological processes which occur in these organisms.

Illustrations have been very well planned for instructional purposes. In a few places the symbols are confusing, as for example on page 222 in the discussion on oxidation-reduction balance, the symbol for zero and oxygen have not been clearly differentiated. Parenthetically it should be stated

that the authors have made several errors in this discussion. In calculating an O/R balance the balance should not only be unity in the case of substrates whose oxidation value is zero but in all cases irrespective of the oxidation value. This follows since a carbon balance is required and for every oxidation there is a reduction. The last two columns in the table on page 222 do not represent millimoles of oxidized and reduced products.

Actually the foregoing criticisms are minor when one considers the value of the textbook as an introduction to bacterial physiology. It is hoped that the authors will continue their excellent work and evolve the perfect textbook for this subject.

L. O. KRAMPITZ

Annual Review of Biochemistry. Vol. 23. J. Murray Luck et al., Eds. Annual Review, Inc., Stanford, Calif. 1954. 636 pp. \$7.00.

The prefatory chapter by Karl Thomas entitled "Fifty Years of Biochemistry in Germany" serves to illustrate the difficulties encountered by students, teachers, and researchers in keeping abreast of current developments in biochemistry. Since it is impossible for one individual to digest the wide diversity of biochemical literature, the need for an authoritative annual review is imperative. This breadth is seen by the review of the precision of analytical procedures in the clinical laboratory by Wootton, Milne, and King and the survey of Coenzyme A catalyzed reactions in the chapter on carbohydrate metabolism by Weinhouse.

The nineteen chapters are divided generally into classical topics. Biological oxidations, including a timely review of electron transport at the cytochrome level and dinitrophenol action are reviewed by Anfinsen and Kielby. Carbohydrates are well covered in two chapters on the "Chemistry of Carbohydrates" by Whistler and McGilvray and "Carbohydrate Metabolism" by Weinhouse. Although these three chapters tend to overlap, this duplication is fully warranted. "Proteolytic enzymes" by Desnuelle, "Nucleic Acids" by Allen, and "The Chemistry of Proteins, Peptides, and Amino Acids" by Hughes and Sinex are concisely and well treated. Three chapters are reserved for the fat and water soluble vitamins. Phillips and Constant review recent advances in nutrition, and Griffin surveyed the biochemistry of cancer, principally the biochemistry of carcinogenesis. Several other chapters are the subject of selected systems. Mommaerts covered the biochemistry of the muscle, Stack-Dunne and Young the pituitary and adrenal interrelationship, and Roche and Michel the thyroid hormones and iodine metabolism. Recent advances in the mineral metabolism of animals is treated by Davis.

The last two chapters are particularly interesting to microbiologists. In one, Roblins summarizes selective aspects of metabolite antagonists, their metabolism, and the interpretation of their results.

The last chapter, by Kalckar and Klenow, is a must for anyone interested in intermediate metabolism. These authors review the important aspects of phosphorylation and dephosphorylation reactions as well as a more general survey of the metabolism of phosphorus compounds.

The editors deserve praise for the production of such a volume of expert essays, well indexed, and containing over 4200 references. This volume should serve a useful function in the reference library of not only biochemists, but also microbiologists.

HARLYN HALVORSON

Advances in Enzymology. Volume 15. F. F. Nord, Editor. New York, Interscience Publishers, Inc. 1953. 533 pages plus Circulative Index Volume I-XV. \$11.00.

Contents: The Mechanism of Enzymic Oxidoreduction, S. J. Leach; Thermodynamique des Reactions Immunologiques, Rene Wurmser; Chemistry, Metabolism, and Scope of Action of the Pyridine Nucleotide Coenzymes, Thomas P. Singer, and Edna B. Kearney; Alternate Pathways of Glucose and Fructose Metabolism, Efraim Racker; Enzymic Mechanisms in the Citric Acid Cycle, Severo Ochoa; The Mechanism of Action of Hydrolytic Enzymes, H. Lindley; Enzymic Synthesis of Polysaccharides, Maurice Stacey; Urea Synthesis and Metabolism of Arginine and Citruline, S. Ratner; Thiaminase, Akiji Fujita; Rennin and the Clotting of Milk, N. J. Berridge; Die Struktur des Tabakmosaikvirus und seiner Mutanten, Gerhard Schramm.

The chapters on Glucose and Fructose Metabolism, Reactions of the Citric Acid Cycle, Pyridine Nucleotide Coenzymes, Urea, Arginine and Citruline Metabolism, and the Synthesis of Polysaccharide are contributions of particular interest to bacteriologists. In addition the chapters on Thermodynamics of Immunological Reactions, Structure of Tobacco Mosaic Virus, the Clotting of Milk and Thiamin are related to problems of interest to the bacteriologist.

The contribution on Carbohydrate Metabolism provides a timely summary and explanation of the work in this rapidly moving field. Some of the data obtained with bacteria are discussed in relation to the picture emerging from studies with yeasts and animals tissues. In the section on the citric acid cycle, the discussion centers around the generation and conversions of acyl coenzyme A compounds. In addition, the systems for pyruvate degradation which have been studied largely in bacteria are discussed in detail. In the chapter of Urea Metabolism, in addition to a comprehensive review of the complex mechanism found in mammalian tissue, the metabolism of arginine and citruline by bacteria is discussed in relation to the general problem. The purpose of the chapter on Polysaccharide Synthesis is to review develop-

ments since the earlier reviews published in *Advances* rather than to cover the field completely.

The chapters on the Thermodynamics of Immunological Reactions (in French) and on the Structure of Tobacco mosaic virus (In German), while of general interest to bacteriologists may be read only by those sufficiently interested in these fields to make the necessary translations.

W. A. WOOD

Nature and the Greeks. Erwin Schrödinger. New York, Cambridge University Press. 1954. 97 pages. \$2.00.

The *raison d'être* for this book is probably best elucidated by quoting from the preface of the authors *What is Life?* published six years ago. "We have inherited from our forefathers the keen longing for unified all embracing knowledge—but on the other hand it has become next to impossible for a single mind to command more than a small specialized portion of it. I can see no other escape from this dilemma—than that some of us should venture to embark on a synthesis of these facts and theories, albeit with second-hand and incomplete knowledge—and at the risk of making fools of ourselves". *Nature and the Greeks* may be considered as the first step in that synthesis; it has been achieved, in beautiful English, without experiencing the risk the author recognized.

Schrödinger's thesis is that the unified all embracing knowledge is at present denied us by *inter alia* the disagreement among the sciences and, of greater moment, the conflict between science and religion: the two paths, that of the heart and that of pure reason, separated by a wall. "We look back along that wall: could we not pull it down, has it always been there? As we scan its windings over hills and vales back in history we behold a land far far away at a space over two thousand years back, where the wall flattens and disappears and the path was not yet split, but was only *one*." The exposition of this *one* from the view point of the Pythagoreans, the Ionians, Xenophanes, Heraclitus of Ephesus and the Atomists forms the bulk of the book.

To one schooled under a Progressive Education system that failed to evoke a felt need for philosophy this exposition is satisfying, particularly so in that a chronological development is not employed. Less satisfying but, to the reviewer, more stimulating is the development and exposition of the conflict between the heart and pure reason, a conflict that obviously distresses Schrödinger.

All religious movements, he points out, have as their goal an attempt to put man more at ease in the bewildering environment he ever finds about him, to raise his confidence in life and faith in his fellows. To do this the ordinary man requires an explanation of those traits of the material world that are not yet really understood at the time or not understood in a way the ordinary man can grasp. Leaders of religious movements have usually, aside from their extraordinary qualities of character and leadership, been quite ordinary men themselves and, therefore, felt the same needs and possessed the same lack of understanding.

After the renaissance this became very important as on the one hand religion became "codified and petrified", and science on the other hand came to transform, beyond recognition, the daily life and thereby intrude into the life of every man. Mutual distrust was bound to develop. On the part of science this involves incompetent interference in scientific disguise. In an honest search for knowledge it is often necessary to tolerate ignorance for and indefinite period. Genuine science puts up with it; "however irksome the gap may be its obliteration by a fake removes the urge to seek a tenable answer."

The recognition, it seems to me, of two points in this masterful portrayal of the basis of conflict between the heart and pure reason, reduces it to a sibling's altercation. These are "the teachings of religion were codified and petrified" and the recognition of ignorance.

Note that it was the *teachings*, not religion itself, that became codified and therefore resistant to modifications that might be implied from the altered conditions in which the world found itself after a thousand years.

Science has not been able to satisfactorily define life, and the other images created by the sense perception of the thinking subject. That it *has* not, does not mean that it *may* not in some far distant future time completely and satisfactorily do so. We in our present state of scientific and mental development are too ignorant to achieve that goal; Daedalus and Icarus failed where after several hundreds of years the Wright brothers succeeded.

Not everyone, probably no one, reading *Nature and the Greeks* will experience my reactions; everyone who reads it will be stimulated to various responses.

M. FIGG

NEWS AND MEETINGS OF LOCAL BRANCHES

Southern California Branch (Frances A. Hallman, Secretary-Treasurer)

July 1, 1954. The Southern California Branch met on the campus of the University of Southern California. Following dinner at the University

Commons a report on S.A.B. Council matters was made by Dr. S. C. Rittenberg, Councilor. The following papers were then presented by guests of the Southern California Branch:

1. Selective media for isolation of lactic acid

bacteria. Reese Vaughn, University of California, Davis, California.

2. The microbiology of frozen pulps and chopped vegetables. Birgit Monnberg, University of Wisconsin, Madison, Wisconsin.

3. Fungi from growing cucumber plants. John Etchells, U.S.D.A. Agricultural Research Service, Raleigh, N. C.

South Florida Branch (Alexander Kimler, President)

February 18, 1954. Beta Streptococci. Dr. Murray Streitfeld and Dr. Milton Saslaw.

April 15, 1954. Viruses and Cancer. Dr. Ben Sallman.

June 17, 1954. Genetics and Immunology of Spirochetes. Dr. De Lamater and Dr. Vincent Saurino.

Maryland Branch (C. Baxter McLaughlin, Secretary-Treasurer)

September 29, 1954. The first meeting of the Branch of the 1954-55 year was held at the Chemical Corps Medical Laboratories, Army Medical Center, Maryland. Following a social session and dinner at the Officers Mess the following program was presented.

1. Epidemiology of Yellow Fever in Central America. Col. Norman W. Elton, M.C.

2. Fulminating Respiratory Disease as a Cause of Sudden and Unexpected Death. Lt. Col. Jacob Werne, M.C.

Michigan Branch (Elizabeth J. Cope, Secretary-Treasurer)

September 18, 1954. The first fall meeting of the Michigan Branch was held at the Michigan Department of Health Laboratories, Grand Rapids, Michigan. Following a picnic lunch on the Laboratories grounds, the following papers were presented:

1. The Antigenic Structure of Yeast Phase Cells of Histoplasma Capsulatum. Lloyd J. Sorensen, E. Edward Evans. University of Michigan, Ann Arbor.

2. A Serological Study of *H. pertussis* and Related Species. (A progress report) Chester Hornbeck and Grace Eldering. Michigan Department of Health, Grand Rapids.

3. The Oxidative Metabolism of Succinate by *Brucella abortus*. Arvid L. Erlandson, R. E. MacDonald, P. Gerhardt. University of Michigan, Ann Arbor.

4. Virus Chemotherapy Studies on Analogs of Chloramphenicol. F. A. Miller, W. A. Rightsel, Research Department, Parke-Davis and Company, Detroit.

5. Role of Symbiotic Phages in Vi Phage Typing of *S. typhi*. Wm. Ferguson, Michigan Department of Health, Lansing.

6. The Effect of Chloramphenicol on the Development of Phage P2. M. Rosenbaum, H. O. Halvorson, C. Levinthal, W. S. Preston. University of Michigan, Ann Arbor.

Eastern Missouri Branch (Lucille K. Schultz, Secretary-Treasurer)

May 25, 1954. The fifty-sixth meeting of the Eastern Missouri Branch of the Society of American Bacteriologists was held at the Wohl Health Center, 1528 North Kingshighway Boulevard. This was an evening meeting and the program was as follows:

1. Report on Discussions Held by the Council Policy Committee and the Council Committee of the National Society of American Bacteriologists at the Annual Meeting in Pittsburgh. Dr. George F. Reddish, Lambert Pharmacal Company, Councilor of the Eastern Missouri Branch, S.A.B.

2. Certain Aspects of Experimental Streptococcal Infections. Robert J. Glaser, M.D., Assistant Professor of Medicine and Assistant Dean of the Washington University School of Medicine.

NEW MEMBERS

New Active Members

June 30, 1954-September 30, 1954

Abrams, Rosalyn Yaskin, Garden Court Apts., 47 Pine Streets, Philadelphia 43, Penna.

Applegate, Charles H., Armour Laboratories, 7th Floor, 1425 W. 42nd St., Chicago 9, Illinois

Arzaga, Nemesio R., U.S.A.F. Hospital, A.P.C.S. Mats, Orlando Air Force Base, Orlando, Fla.

Axelrod, Rima M., 5515 South Dorchester, Chicago, Ill.

Barbachi, Vasil T., 3517 W. North Ave., Chicago 47, Illinois

Barlow, James L., 1639 Waverly Way, Apt. B., Baltimore 12, Md.

Bootman, A. Geraldine, P.O. Box 444, 1200 N. State St., Los Angeles 33, Calif.

Bradley, Frank D., 4249 25th. St. North, Arlington 7, Va.

Brumsted, Donald D., 4884 N. 24th St., Milwaukee 9, Wisc.

Cook, Elizabeth A., 211 East First St., Bloomington, Indiana

Cook, Thomas M., 239 Burns St., S.E., Apt. 23, Washington 19, D. C.

- Czedkalowski, Jaroslaw W., Dept. of Bact., School of Med., Univ. of Leeds, Leeds 2, England
- Dalzell, Major Robert C., 060183, 1133 South Allen St., State College, Pa.
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- Gardner, Earl William, Jr., 3401 Sunset Blvd., Houston 5, Texas
- Goldberg, Leslie S., Brooklyn College, Dept. of Biology, Bedford Ave. & Ave. H, Brooklyn 10, N. Y.
- Hertlein, Bernhard C., Stadium Terrace, F-59 C-1, Champaign, Ill.
- Hunter, Susan V., 2819 Griffith Park Blvd., Los Angeles 27, Calif.
- Jacques, Ruth M., 4496 West Pine, St. Louis, Mo.
- Jensen, Robert G., 224 Eckles Hall, Dept. of Dairy Husbandry, Univ. of Missouri, Columbia, Mo.
- Kalnitsky, George, Dept. of Biochemistry, State University of Iowa, Medical Laboratories, Iowa City, Iowa
- Kanfer, Julian N., 1562 Ocean Avenue, Brooklyn, New York
- Kaplan, Herbert I., 1100 North 21st Street, Camden 5, New Jersey
- Kautter, Donald A., M B Division Camp Detrick, Frederick, Md.
- Kissel, Thomas L., 37 W. Lincoln Ave., Hartford, Wisc.
- Kucera, Joseph L., Res. & Development Dept., Rath Packing Co., Waterloo, Iowa
- LaFoe, Lorin G., Hq. & Hq. Btry. 29th AAA Bn. (AW) (SP), APO 201, c/o Postmaster, San Francisco, Calif.
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- Lopez, Cecilia, Carrera 6, 58-63, Bogota, Colombia, S. A.
- Marr, Eleanor K., Dept. of Biology, Lehigh University, Bethlehem, Pa.
- McDade, Joseph J., Box 4684, University of Kentucky, Lexington, Ky.
- Mehlman, Ira J., 417 G Street, Davis, Calif.
- Menard, Richard R., Child Res. Center at Michigan, 660 Frederick, Detroit 2, Mich.
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- Moddes, Robert E., Loras College, P.O. Box 25, Dubuque, Iowa
- Mohan, Ramanuja Iengar R., Research Dept., National Agricultural College, Farm School P.O., Bucks County, Penna.
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- Norsen, Jeannette, Virologist, Dept. of Microbiology, Nepera Chemical Co., Yonkers 2, N. Y.
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- Phillips, William F., Res. & Devel. Dept., Commercial Solvents Corp., Terre Haute, Indiana
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- Power, David A., 751 Silver Spring Ave., Silver Spring, Md.
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- Roy, David John, Dept. of Microbiology, S.A. Bureau of Standards, Private Bag 191 Pretoria Transvaal, South Africa
- Salinas, Olivia V., Nepera Chemical Co., Yonkers 2, N. Y.
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- Souza, Francisco Chagas, Praca D Feliciano 56-Apto 74, Porto Alegre, Rio Grande do Sul Brazil, S.A.
- Stelos, Peter, 1009 East 57th Street, Chicago 37, Illinois
- Valverde-Montero, Porfirio, Quimico Clinico Microbiologo, Barrio Carit No. 2845, San Jose, Costa Rica
- Wagenaar, Raphael O., Food Res. Inst., Univ. of Chicago, 5650 South Ellis Avenue, Chicago 37, Illinois
- Weber, William A., 6621 Sutherland Avenue, St. Louis 9, Missouri
- White, Morris F., Detroit Dept. of Health Lab., Herman Kiefer Hospital, 1151 Taylor Ave., Detroit 2, Mich.
- Wood, E. J. Ferguson, P.O. Box 21, Cronulla, N.S. Wales, Australia
- Wright, Noble M., 906 West Virginia St., McKinney, Texas

Wulf, Johannah J., 128 Kansas City St., Rapid City, S. Dak.

Yarashus, Donald A., Berwyn Hlth. Dept. Lab., 6600 W. 26th Street, Berwyn, Illinois

Yoshino, Pfc. Clarence S., US 50007382 Det #4, 6006th SU (SC) 6th Army Med. Lab., Fort Lewis, Wash.

Young, Richard, 221 West Eighth St., Wilmington 1, Delaware

Zalesky, Margaret R., 3224 Lemmon Ave., Apt. B, Dallas 4, Texas

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